

REMARKS

Applicants have thoroughly considered the Office action dated September 12, 2007 and have amended the application accordingly. Claims 1, 3, 8, 14, 18, 22, 50, 52, and 53 have been amended, and claim 17 has been canceled by this Amendment E. Claims 1, 3, 8, 14-16, 18-22, 26, 50, 52-58, 62, and 76 are thus presented in the application for further examination. Reconsideration of the application as amended and in view of the following remarks is respectfully requested.

Claim Rejections under 35 U.S.C. 112

Claim 8 stands rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement. The Examiner asserts that the Application does not disclose or enable the limitation “each processor... generating data”. Applicants disagree. For example, see Application at paragraph [0009]: “Another aspect of the present invention is the provision of a method and system for multi-level railway operations optimization for a complex railroad system that identifies key operating constraints and data at each level, communicates these constraints and data to adjacent levels and optimizes performance at each level based on the data and constraints of adjacent levels.” Also see Application at FIGS. 3, 4, 6, 11, 13, 16, and 21. Thus, the present Application clearly discloses each processor generating data and communicating the data to other processors at other levels of the infrastructure. Applicants request that the Examiner withdraw the rejection.

Claim 22 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner asserts that “compliance of the second level with the system optimization parameter,” is indefinite. Claim 22 has been amended to recite “data of the second level relevant to the system optimization parameter.” This is explained, for example, at paragraph [0052] of the present application where the track network level balances fuel costs against delivery schedule compliance. See also paragraph [0010] of the application. Applicants therefore request that the Examiner withdraw the rejection of claim 22.

Claim Rejections under 35 U.S.C. 102

Claims 1, 3, 8, 14-22, 26, 50, 52-58, and 62 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,828,979 to Polivka et al. (hereinafter Polivka). However, a claim is anticipated only if each and every element as set forth in the claim is disclosed, either expressly or inherently, in a single prior art reference. Verdegal Bros. v. Union Oil. Of California, 814 F.2d 628, 631 (Fed. Cir.1987). Applicants submit that each and every element as set forth in claims 1, 3, 8, 14-16, 18-22, 26, 50, 52-58, and 62 is not found, either expressly or inherently, in Polivka. Thus, the cited reference does not anticipate the claimed invention.

At page 12 of the Office action, the Examiner asserts that the functional limitations of the claims do not distinguish the structural limitations of the invention from the prior art citing MPEP 2114 and 2115. The cited MPEP sections state that an apparatus claim is not limited by including a disclosure of the result of using the apparatus, or the context in which an apparatus is used. This is not the applicable rule to the present claims. MPEP 2173.05(g) sets forth the rules for functional limitations defining structural components of an apparatus claim saying:

"A functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. In re Swinehart, 439 F.2d 210, 169 USPQ 226 (CCPA 1971).

A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. A functional limitation is often used in association with an element, ingredient, or step of a process to define a particular capability or purpose that is served by the recited element, ingredient or step. >In Innova/Pure Water Inc. v. Safari Water Filtration Sys. Inc., 381 F.3d 1111, 1117-20, 72 USPQ2d 1001, 1006-08 (Fed. Cir. 2004)."

Applicants submit that the claims as amended recite structures using specific ingredients (e.g., characteristics of service facilities) that enable aspects of the invention, and that the claims fairly convey to one skilled in the art that service facility capabilities and/or availability are integrated into the interaction of elements of the present invention. Because functionally defined structural elements are not inherently improper, the Examiner must consider what the functional limitations of the present claims fairly convey to a person of ordinary skill in the art. See MPEP 2173.05(g).

Polivka discloses a system for controlling the "movement of plural trains through a network of track in a multiple route railway system" (see Polivka at column 1, lines 7-19). The system of Polivka includes a system wide planner, a dispatcher, and an onboard computer on each train to be controlled. The system wide planner determines a coarse schedule which the dispatcher uses to develop a movement plan. The dispatcher directs the movement of trains and track force vehicles (i.e., vehicles riding on the tracks) according to the movement plan by providing a trip plan to each train or track force vehicle and may direct track switches and signals to accommodate the movement plan (see Polivka at Col. 4, Line 39- Col. 5, Line 4).

In contrast to the cited art, the present application teaches controlling and coordinating trains and infrastructure equipment as a function of input from service facilities of the railroad infrastructure. An infrastructure level 100 of the multi-level railway system refers to, for example, maintenance facilities and service sidings. Infrastructure data includes facility location, facility capabilities (both static characteristics such as the number of service bays, as well as dynamic characteristics, such as the availability of bays, service crews, and spare parts inventory), facility costs (such as hourly rates, downtime requirements), and other data such as weather conditions, natural disaster and business objective functions. The infrastructure processor 202 analyzes this input data and optimizes the railroad infrastructure level 100 operation by issuing work orders or other instructions to the service facilities for the particular trains to be serviced, as indicated in block 226, which includes instructions for preparing for the work to be done such as scheduling work bays, work crews, tools, and ordering spare parts. The infrastructure level 100 also provides instructions that are used by the lower level systems. Track commands 228 are issued to provide data to revise the train movement plan in view of a service plan (or a change to a service plan), advise the rail yard of the service plan such as reconfiguring the train, and provide substitute power of a replacement locomotive. Train commands 230 are issued to the train level 300 so that particular trains that are to be serviced may have restricted operation or to provide on-site servicing instructions that are a function of the service plan (see Application at paragraphs [0038]-[0041]). Aspects of the invention enable the railway system to dynamically adapt to changes in the capability and availability of both trains, and all of the service equipment necessary to support the railway infrastructure. To this end claim 1 recites, "... a first processor associated with a railroad infrastructure level configured

to control an operation of the railroad infrastructure, **said railroad infrastructure including servicing operations**; a second processor associated with a railroad track network level configured to control an operation of the railroad track network, wherein the railroad track network level is a sub-level of said railroad infrastructure level; said first processor **generating service plan data provided to at least one other processor of the system**, said first processor responsive to generated data generated by at least one other processor of the system to define operational characteristics and performance data for the railroad infrastructure and to generate output instructions corresponding to the defined operational characteristics and performance data for the railroad infrastructure, and said first **processor controlling the operation of service operations** of the railroad infrastructure in accordance with the generated output instructions for the railroad infrastructure; said second processor **generating train movement plan data provided to at least one other processor** of the system, said second processor **responsive to service plan data provided by the first processor** to define operational characteristics and performance data for the railroad infrastructure level and to generate output instructions corresponding to the defined operational characteristics and performance data for the railroad infrastructure level, and said second processor controlling the operation of the railroad infrastructure level in accordance with the generated output instructions for the railroad infrastructure level...."

Claim 14 recites, "... a first level **configured to control a servicing operation** within the first level, said first level including first level operational parameters defining changes in operational characteristics of service facilities of the railroad infrastructure and data of the first level; and a second level configured to control an operation within the second level, said second level including second level operational parameters defining changes in the operational characteristic and data of the second level wherein the second level is a sub-level of said first level; said first level providing the second level with the first level operational parameters at regularly scheduled intervals, and the second level providing the first level with the second level operational parameters at periodic intervals; and said controlling the operation within the first level and said controlling the operation within the second level each being a function of the first and second level operational parameters.

Claim 50 recites, "... a first level including **first level operational parameters defining changes in operational characteristics of service facilities of the railway system** and data of

the first level; and a second level including second level operational parameters configured to control an operation within the second level as a function of the first level operational parameters and second level operational parameters and wherein the second level operational parameters are indicative of changes in operational characteristics and data of the second level, wherein the second level is a sub-level of said first level; and said second level continuously providing the first level with second level operational parameters, and wherein said first level continuously determines the first level operational parameters as a function of the provided second level operational parameters.

Applicants therefore submit that the cited references fail to teach each and every element of the invention as claimed and that claims 1, 14, and 50 are allowable over the cited art. Claims 3, 8, 15-16, 18-22, 26, 52-58, 62, and 76 depend from these claims and are allowable over the cited art for at least the same reasons as the claims from which they depend.

Support in the Specification

Support for the amendments to claims 14 and 50 can be found in the specification at, for example, paragraphs [0042] [0046] and [0056].

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CONCLUSION

In view of the foregoing, applicants submit that amended claims 1, 14, and 50 are allowable over the cited art. The remaining dependent claims are believed to be allowable for at least the same reasons as the independent claims from which they depend.

It is felt that a full and complete response has been made to the Office action, and applicants respectfully submit that pending claims 1, 3, 8, 14-16, 18-22, 26, 50, 52-58, 62, and 76 are allowable over the cited art and that the subject application is now in condition for allowance.

The fact that applicants may not have specifically traversed any particular assertion by the Office should not be construed as indicating applicant's agreement therewith.

The Commissioner is hereby authorized to charge \$120.00 to cover the fee for a one-month extension of time up to and including today's date, or charge any underpayment to Deposit Account No. 07-0846.

Respectfully submitted,

/Frank R. Agovino/

Frank R. Agovino, Reg. No. 27,416
SENNIGER POWERS
One Metropolitan Square, 16th Floor
St. Louis, Missouri 63102
(314) 231-5400

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